

DEMO SETUP NE64 / POE / ZIGBEE BADGE BOARD

This procedure describes the steps necessary to run the demo of NE64/PoE/ZigBee Badge Board (ERC-PCB-0059 Rev3).

Components Included:

- PCB, NE64/POE BADGE BOARD ERC-PCB-0059 R3
- Ault Power Supply PW130RA4800F01
- Maxstream Xbee Pro module M100245 (mounted on board)
- CodeWarrior Development Studio for HC(S)12 v3.1
- Link to website to download drivers and more information

Components Required:

- PC, running Windows XP, 2000 or NT. Win98 has not been tested and is not supported. Internet Explorer 5 or later must also be installed.
- RS232 cable, Male-Female, DB9
- Cat5 Ethernet cable, straight-through
- Cat5 Ethernet cable, cross-over
- IEC AC Power Cord

Optional Components:

- Maxstream Xbee Pro module with M100246 RS232 Interface PCB and Wall-mount power supply (for wireless communication)
- Parallel Port Cable or USB cable (for board reprogramming)
- P&E Microcomputer Systems BDM-Multilink or USB Multilink (for programming)
- Packet sniffing software (like a freeware called Ethereal).

Steps covered

- Setting up the PC
- Connecting the board
- Web server demo
- Serial and Ethernet chat
- Direct control

1. Introduction

The NE64 Badge board is an evaluation platform used to demonstrate 3 technologies, Ethernet, ZigBee and Power Over Ethernet (PoE).

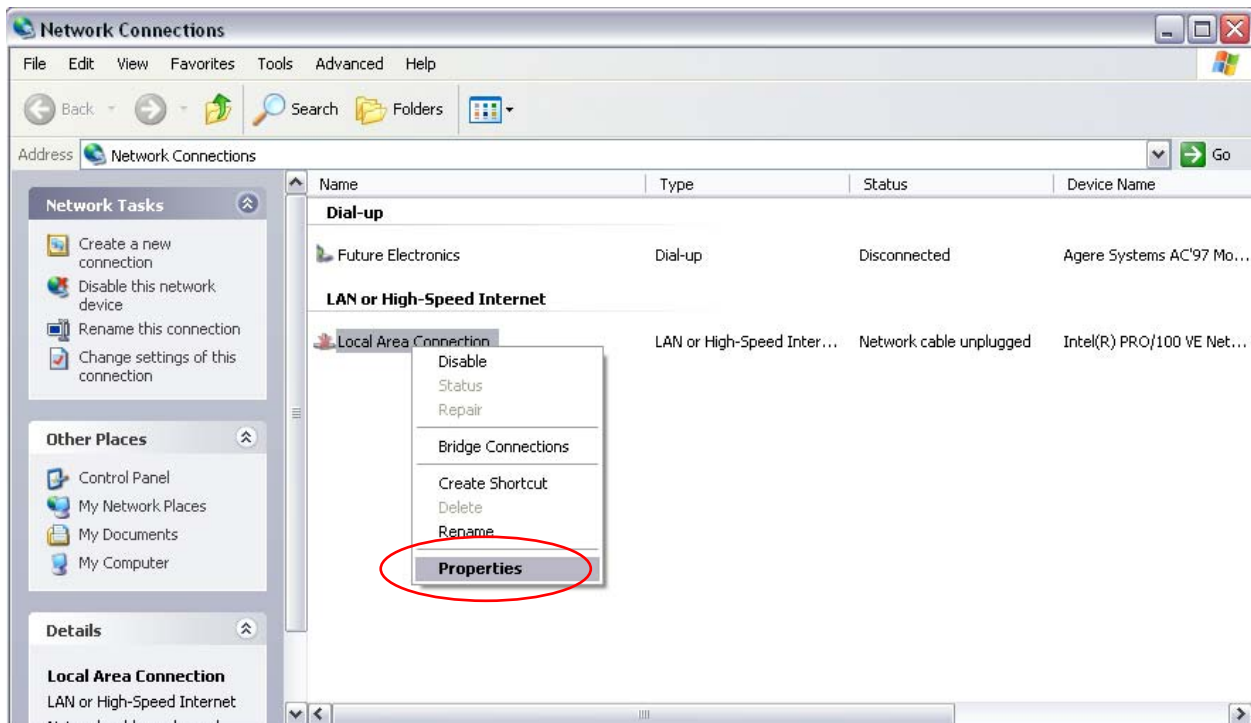
The board comes preloaded with an application software, a modified version of Freescale's AN2836, that implements a 3 way communication bridge function between ethernet and 2 serial ports on top of a simple web server. A Maxstream ZigBee module is connected to one of these serial links for RF networking and communication.

The ethernet stack used is OpenTCP, a royalty free open source stack. Code size, including support or basic functionality for TCP, UDP, HTTP, POP3, ICMP, ARP, SMTP, DNS, TFTP, etc... is less than 22KB.

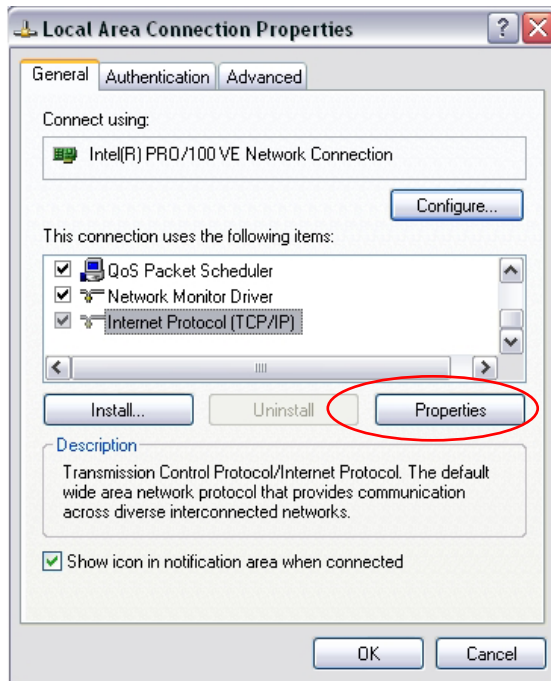
For simplicity reasons, all the IP addresses and port numbers are static and embedded in the code at compile time. This can easily be changed.

2. Setting up the PC

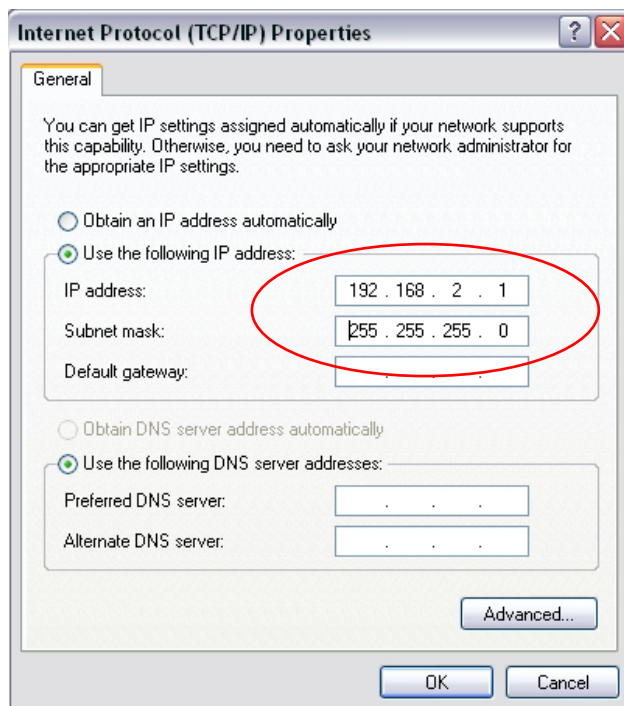
From the control panel, *Network Connections*, right click on your *Local Area Connection* and select *Properties*. (also accessible through the lower left *start -> settings -> network connections*)



From the list, select the last item *Internet Protocol TCP/IP* and click on Properties.



Under the general tab, click the *use the following IP address* radio button and enter the address **192.168.2.1** with a subnet mask of **255.255.255.0** as shown. **Please remember these changes; you will need to restore the setting to what it was before.** Most computers on a network will have the original setting as *Obtain the IP address automatically*.



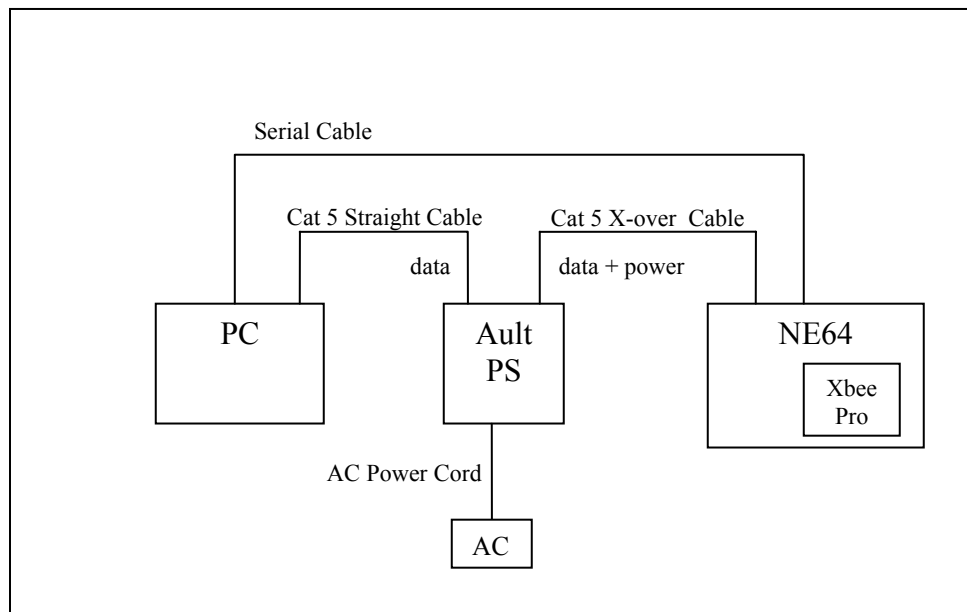
Click ok and close the Network Connections properties box. Your computer now has a static IP address.

You may also have to click advanced and disable any proxies you may have.

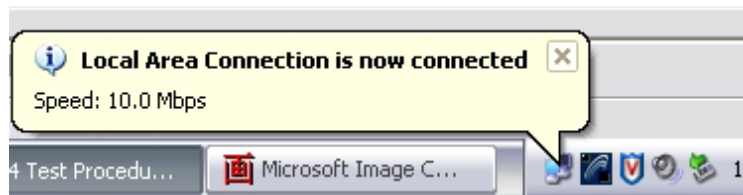
Then, open TeraTerm or your favorite terminal program and set the communication speed to 115200 baud, 8 bits, 1 stop, no parity and no flow control.

Also start the Visual Basic application called NE64_demo.EXE

3. Connecting to the board



Apply power to the AULT supply only after all is connected. You should now see a valid connection status in the PC's status bar.



A quick test can be done at this point using a PING command from a DOS window. This is totally optional.

4. Webserver Demo

Start the Internet Explorer and type 192.168.2.3 in the address bar as shown below. You should get the following web page displayed. The name index.htm will be added automatically since it is the default main page being called by an HTTP GET command requested by the web browser.




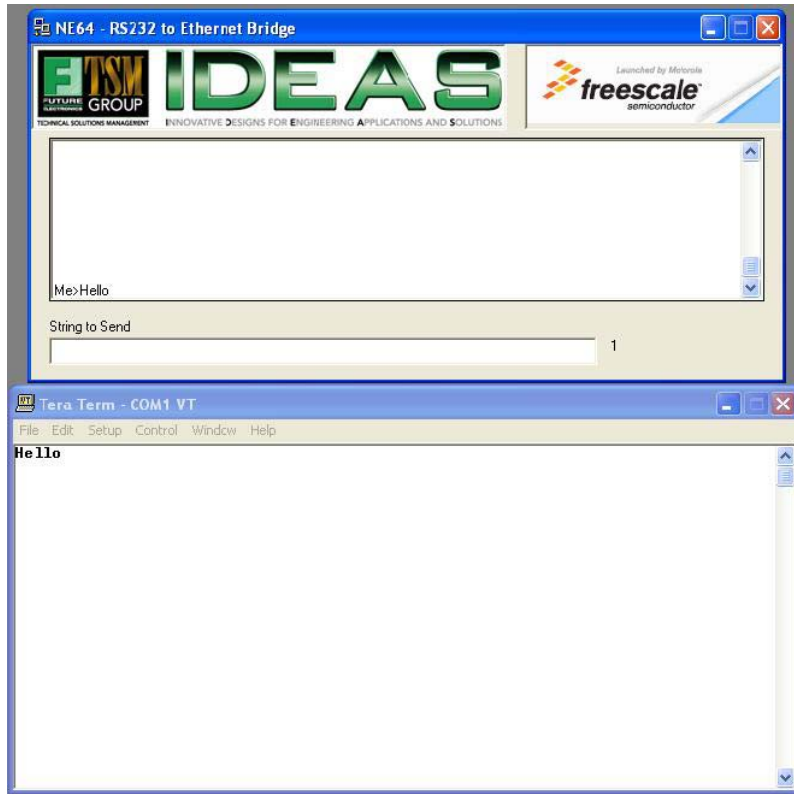
You can navigate to the various pages with the links on the bottom, 3 are shown.

Please note that the visual quality of the images is the result of the very high JPEG compression ratio used. This was necessary to use the minimal amount of storage in the processor. Applications using the NE64 as a web server may optionally store the static HTML and graphics in an external serial flash device interfaced by an SPI or I2C bus. Such low pin count devices can readily store megabytes of information leaving the NE64 flash for application code.

5. Serial chat demo

Once all connected, you can start passing information through the running bridge application by typing some text in the *string to send* portion of the window.

 Please note that the whole process is initiated by entering text in the Visual Basic window at first!. If text is entered from the serial terminal initially, it will not be retransmitted via ethernet and displayed on the PC. This small issue may be fixed in later versions.



Any text that is typed in or received is being buffered until a carriage return is detected. The string is then sent to the other ports.

Some Windows installations may require an ActiveX driver file to be present in the WINDOWS/SYSTEM32 directory, namely Mswinsck.ocx. If you get the error message when launching the VB application, you can download this file from our web site (see section 8 of this document) and copy it to your windows/system32 directory. We have also seen some systems asking for a richtx32.ocx driver file. It can also be downloaded and installed in the same directory.

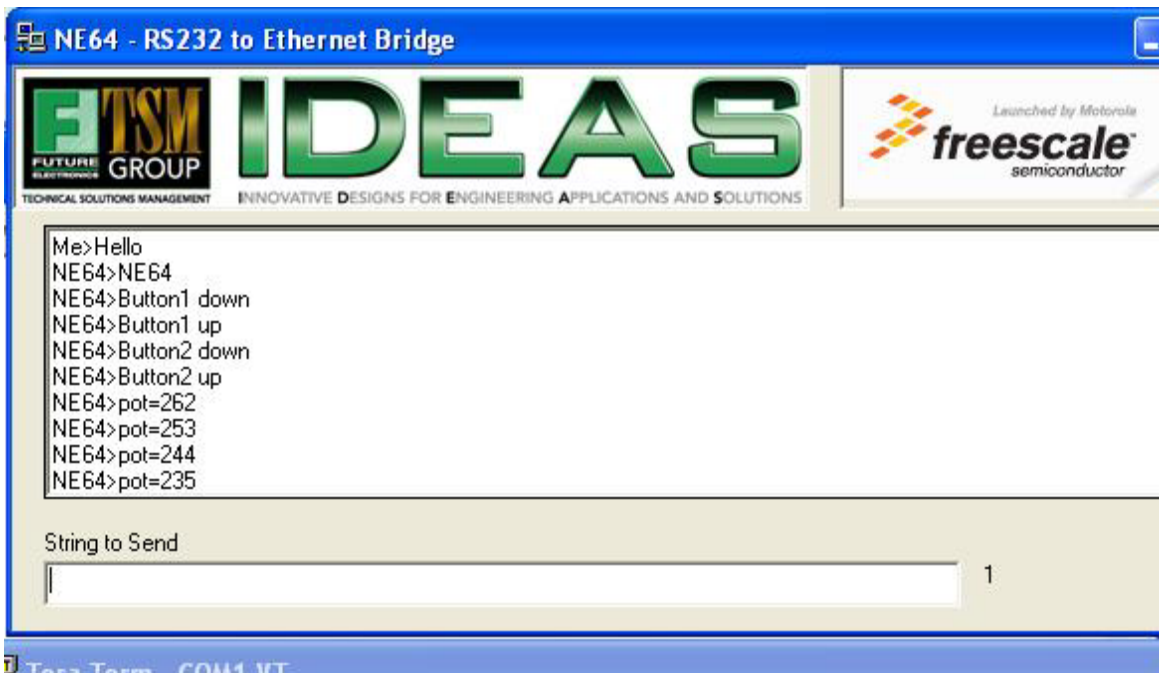
6. Direct Control and local Events

You may also enter the following commands through the Visual Basic application to control some hardware.

- "l1n" will turn led 1 on. (do not enter the " ", only the 3 characters in between)
- "l2n" will turn led 2 on.
- "l1f" will turn led 1 off
- "l2f" to turn led 2 off.

Turning the trim pot will send screen updates through the network and will display on the VB application under `NE64> pot = xxx` with xxx being a decimal value from 0 to 1023 (taken from the on chip 10 bit A/D converter)

Pressing a button will create a *ButtonX down* event and releasing it will create a *ButtonX up* event, sending a specific string over the ethernet. Button1 will turn on led 2 while Button2 will turn it off.



7. RF chat

Another NE64 Badge board with identical setup can be used to demonstrate RF communication and implement a simple wireless text chat.

No specific control strings are sent to the Maxstream modules upon reset, the default configuration is used as is.

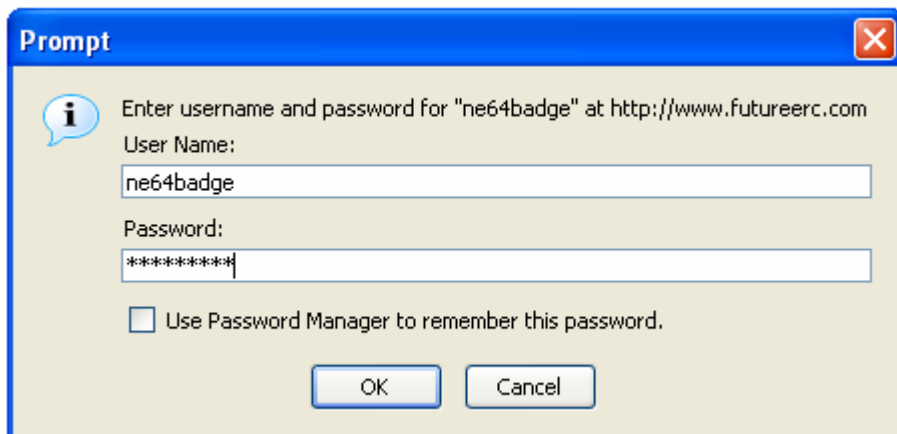
Maxstream also have a stand alone adapter that can hook an RS232 serial link or USB port to another XBee module. Part number M100246.



8. For more Information

To access all the pertinent information related to this project, please go to the following website: (You will be asked for a user name and password, both of these are case sensitive).

<http://www.futureerc.com/ne64badge>



User Name: **ne64badge**
Password: **ne64badge**

The source code is available by request only. It is a modified version of AN2836 available from the Freescale web site.